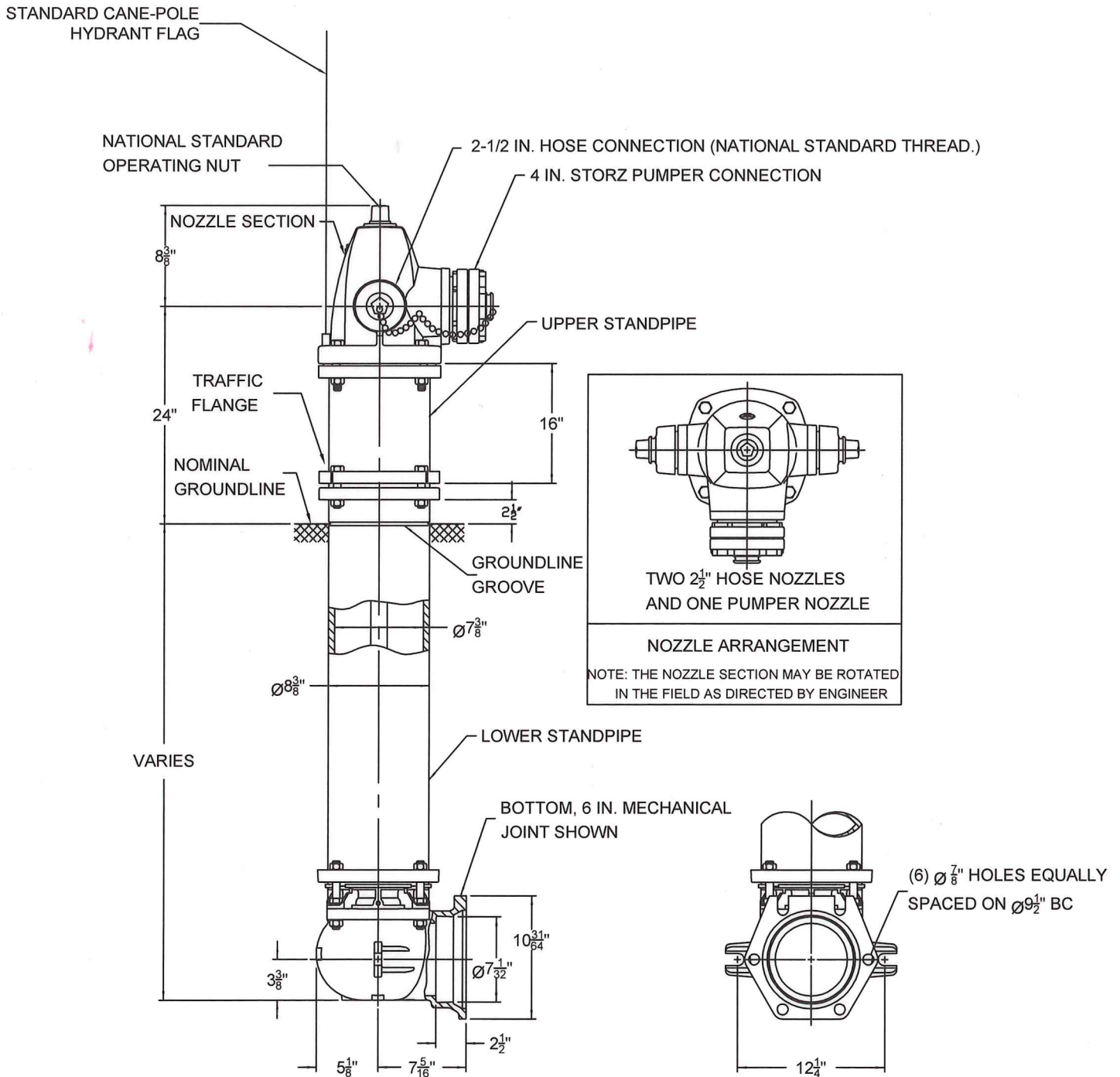


# HYDRANT: WATEROUS WB-67-250



- NOTES: 1. FACTORY PAINTED RED TO GROUND LINE  
2. 16 INCH TRAFFIC FLANGE  
3. 8 FOOT BURY UNLESS OTHERWISE SPECIFIED.

STANDARD  
DETAIL NO.  
WTR-01

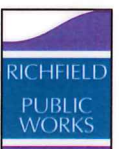
HYDRANT

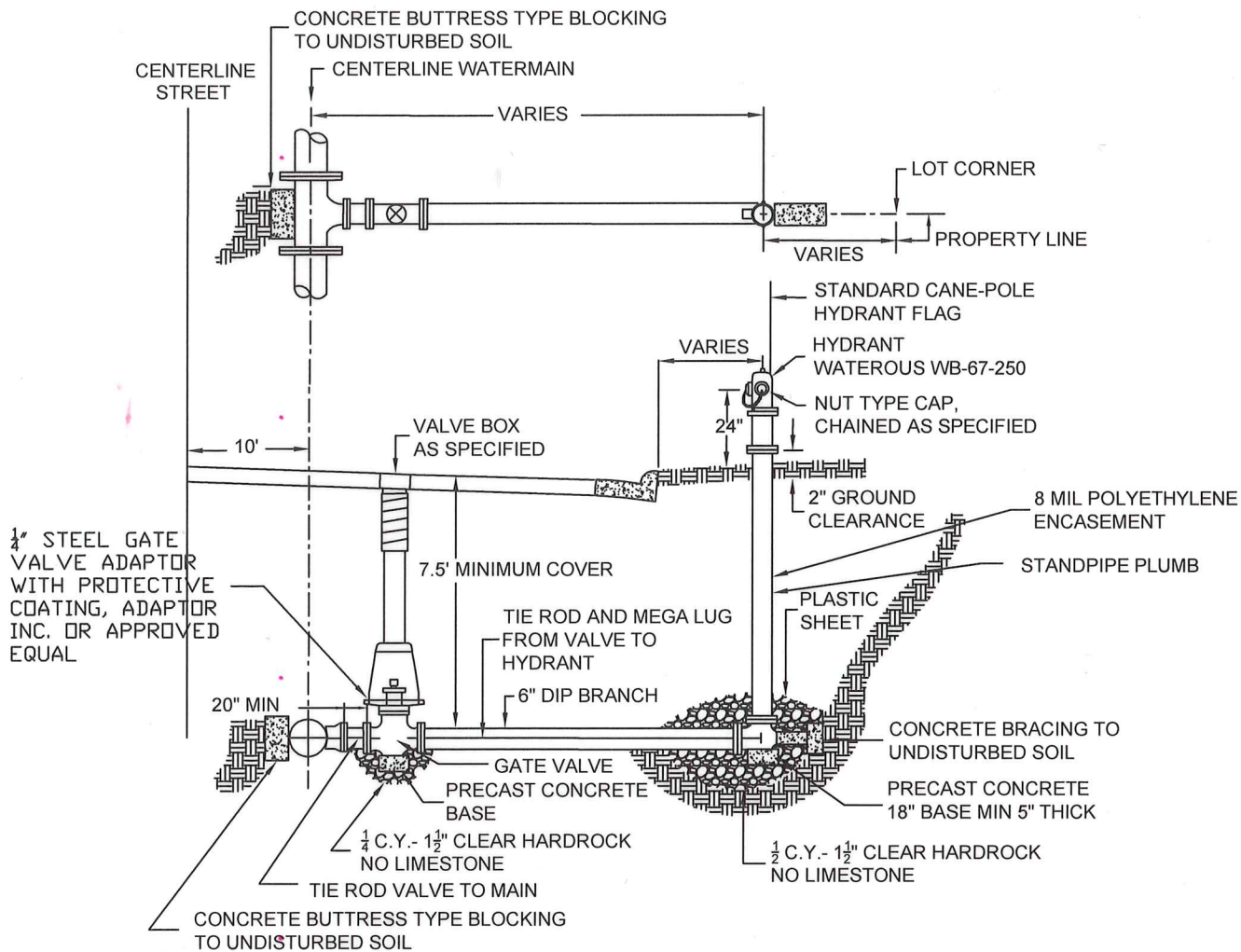
APPROVAL

2012

CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION





- NOTES: 1. ALL HYDRANTS MUST BE 8.0' BURY UNLESS SHOWN OTHERWISE.  
 2. ALL HYDRANT VALVES TO BE LOCATED IN THE STREET.  
 3. AMERICAN FLOW CONTROL 2500 SERIES RESILIENT WEDGE TYPE GATE OR APPROVED EQUAL.  
 4. TIE RODS TO BE  $\frac{3}{4}$ " DIAMETER THREADED (316) STAINLESS STEEL.  
 5. ALL WATERMAIN BOLTS ARE CORE-BLUE OR APPROVED EQUAL.  
 6. POURED CONCRETE OR PRECAST BLOCKS TO BE USED FOR BRACING (NO WOOD, CURBING, SIDEWALK, ETC.)  
 7. ALL JOINTS MUST BE RESTRAINED.  
 8. ALL HYDRANT BARRELS SHALL BE WRAPPED WITH POLYETHYLENE ENCASEMENT.  
 9. WHERE HYDRANT BASE IS IN OR NEAR WATER TABLE, THE WEEPHOLE SHALL BE PLUGGED, AFFIX "PUMP AFTER USE" TAG TO HYDRANT.  
 10. ALL EXPOSED WATERMAIN SHALL BE WRAPPED IN POLYETHYLENE IN ACCORDANCE WITH AWWA C105.

STANDARD  
DETAIL NO.  
WTR-02

## HYDRANT INSTALLATION

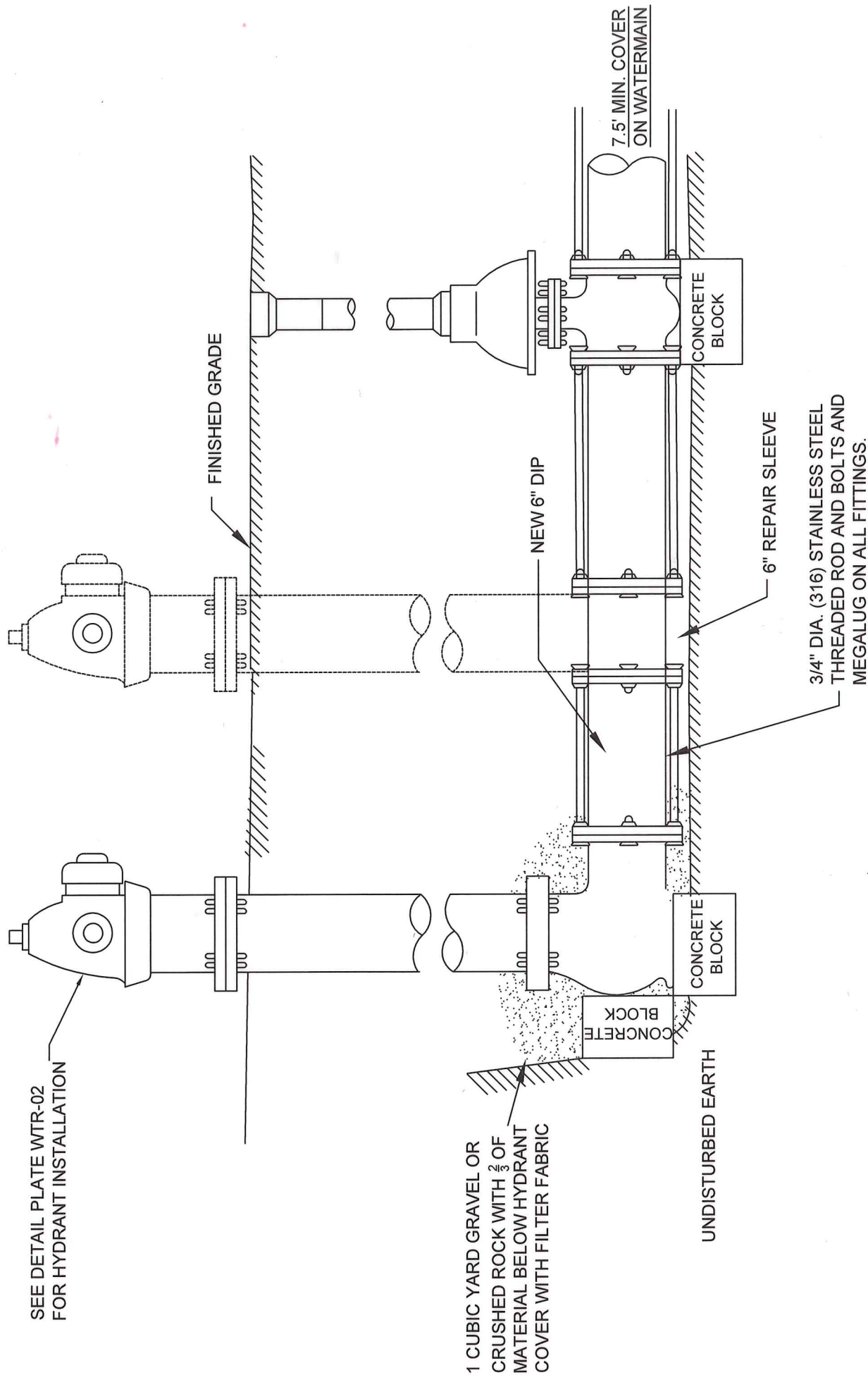
APPROVAL

2/27/2013

CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION





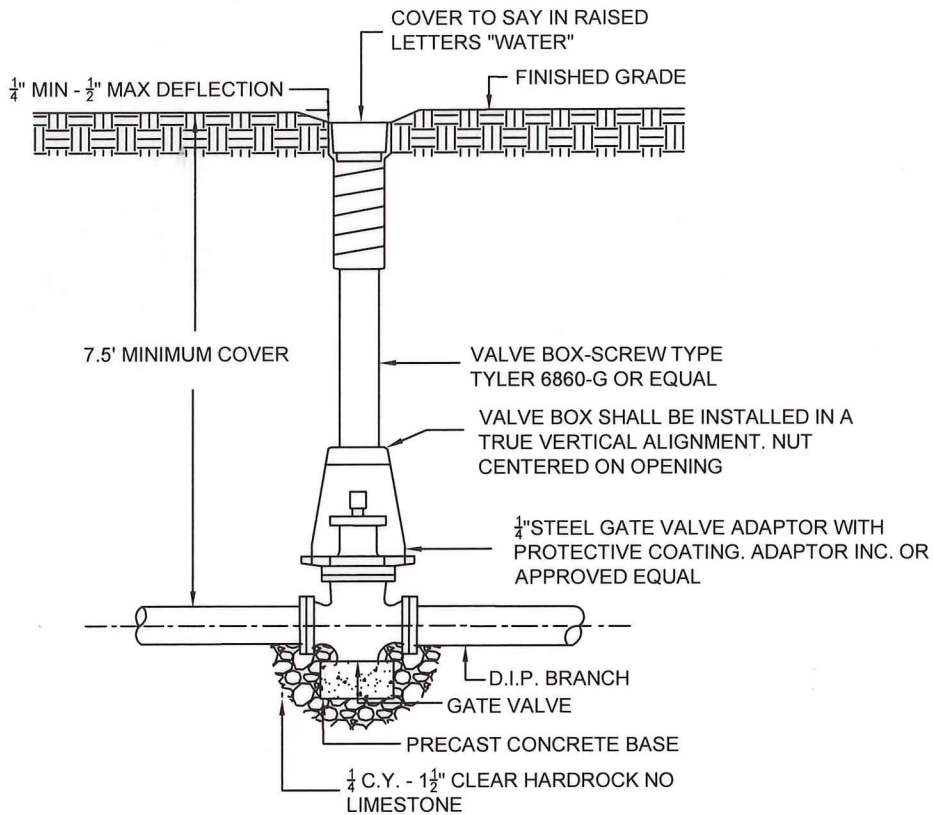
CITY OF RICHFIELD  
ENGINEERING DIVISION

APPROVAL 5/24/12 20  
*[Signature]*  
CITY ENGINEER

## HYDRANT RELOCATION

STANDARD  
DETAIL NO.  
WTR-03





- NOTES: 1. HYDRANT, STUB & SERVICE VALVES SHALL BE RODDED TO THE MAIN AND MEGALUG ON ALL FITTINGS.  
 2. AMERICAN FLOW CONTROL 2500 SERIES RESILIENT WEDGE TYPE OR APPROVED EQUAL.  
 3. TIE RODS AND MEGALUG FROM VALVE TO HYDRANT.  
 4. TIE RODS TO BE  $\frac{3}{4}$ " DIAMETER THREADED (316) STAINLESS STEEL.  
 5. ALL WATERMAIN BOLTS ARE CORE-BLUE OR APPROVED EQUAL.  
 6. NO INSIDE ADJUSTMENT SECTIONS ALLOWED (I.E. NO INSERTS).  
 7. MARKING POSTS SHALL BE SUPPLIED BY THE CITY AND INSTALLED BY THE CONTRACTOR AT ALL GATE VALVES LOCATED OUTSIDE OF STREET SECTIONS.

STANDARD  
DETAIL NO.  
WTR-04

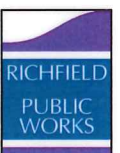
## VALVE BOX INSTALLATION

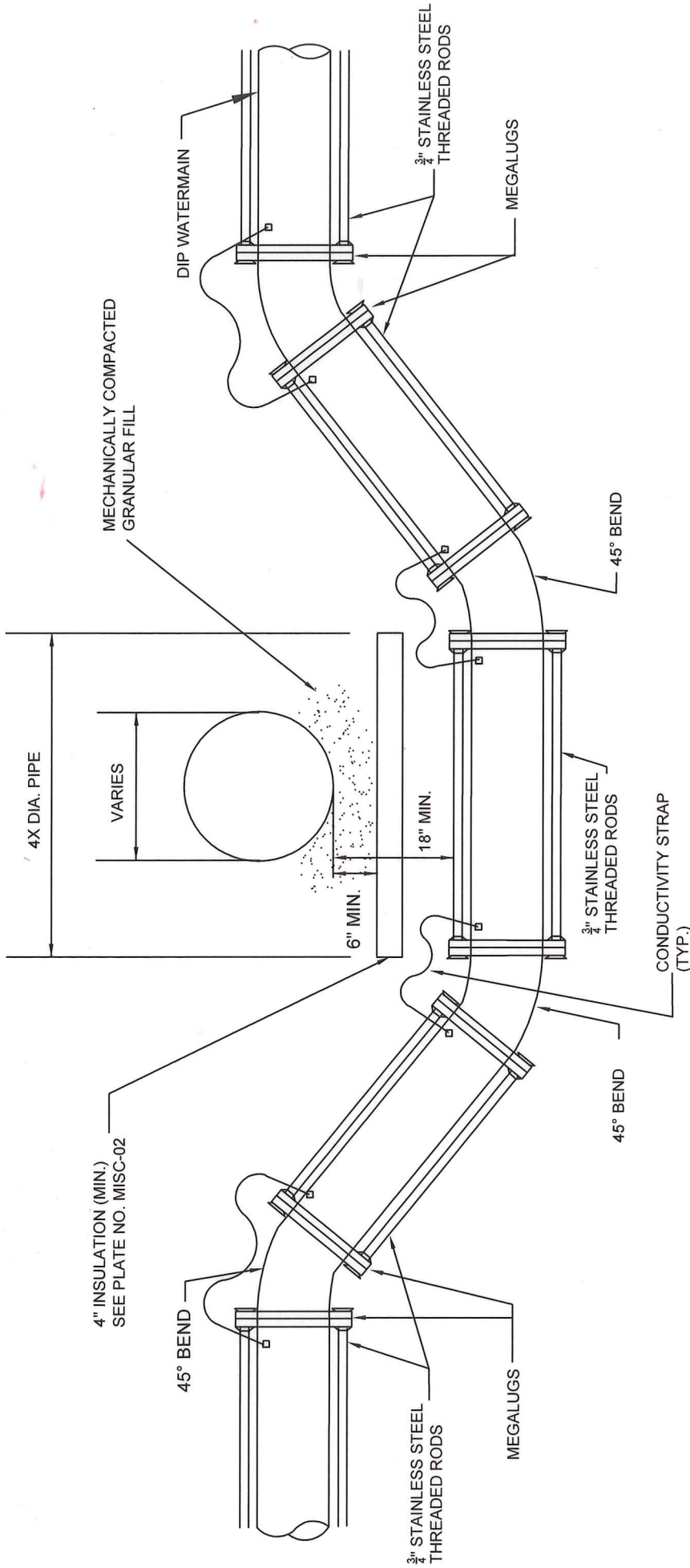
APPROVAL

20

CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION





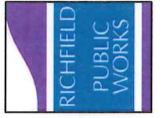
- NOTES:
1. ALL JOINTS SHALL BE RESTRAINED WITH MEGALUGS AND TIE RODS.
  2. INSULATION AND FOUNDATION MATERIAL SHALL EXTEND IN BOTH DIRECTIONS A MINIMUM OF 3'.
  3. INSTALL INSULATION WITH OVERLAPPING JOINTS.
  4. CONDUCTIVITY IS REQUIRED ACROSS ALL JOINTS.
  5. ALL WATERMAIN BOLTS SHALL BE CORE-BLUE OR APPROVED EQUAL..
  6. TIE RODS TO BE 3/4" THREADED (316) STAINLESS STEEL..
  7. ALL EXPOSED WATERMAIN SHALL BE WRAPPED WITH POLYETHYLENE IN ACCORDANCE WITH AWWA C-105.

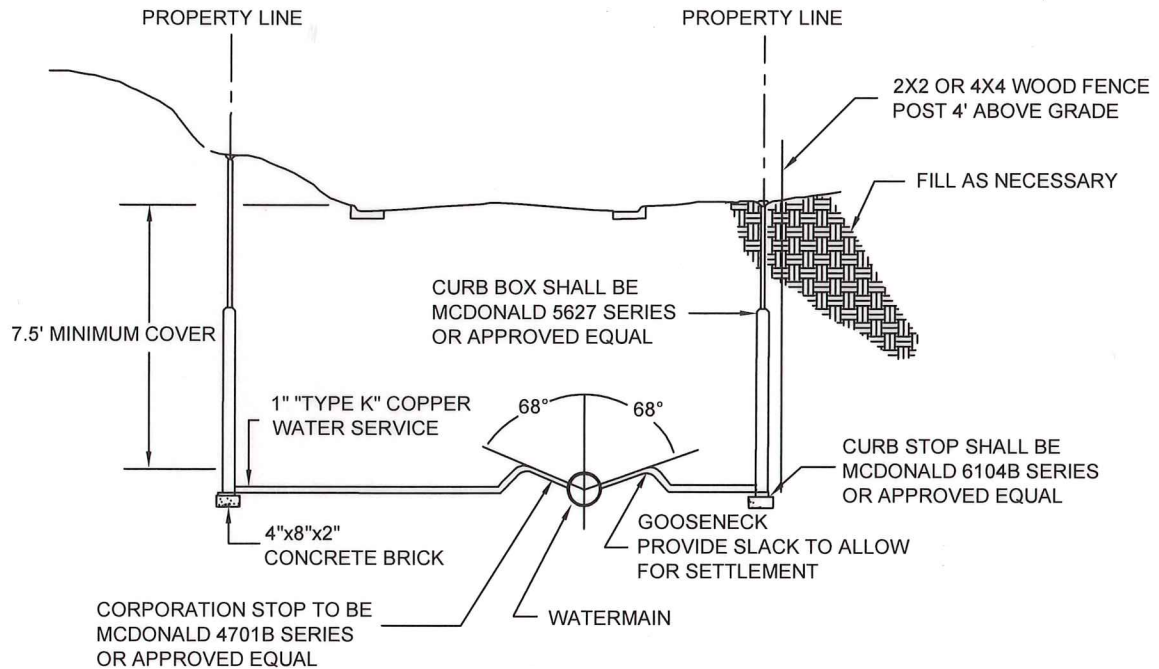
STANDARD  
DETAIL NO.  
WTR-05

# WATERMAIN OFFSET

APPROVAL 5/24/20  
CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION





- NOTES: 1. ALL IRRIGATION SERVICES TO BE 4" DIP UNLESS DIRECTED BY THE ENGINEER.  
 2. NO COPPER TO COPPER CONNECTIONS SHALL BE MADE IN THE PUBLIC RIGHT-OF-WAY.  
 3. MCDONALD TYPE A STYLE RECESSED COVER FRAME, 674M SERIES (4" BURY DEPTH) OR APPROVED EQUAL FOR CURB BOXES IN DRIVEWAYS, SIDEWALKS, OR PARKING AREAS.  
 4. ADJUST CURB STOP TOP 1" BELOW FINISHED GRADE.  
 5. CAP OR PIGTAIL HOUSE SIDE OF THE CURB STOP TO KEEP CLEAN.  
 6. STATIONARY RODS (CURB STOP) ARE NOT ALLOWED.

STANDARD  
DETAIL NO.  
WTR-06

## TYPICAL RESIDENTIAL WATER SERVICE

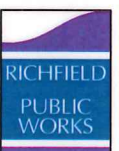
APPROVAL

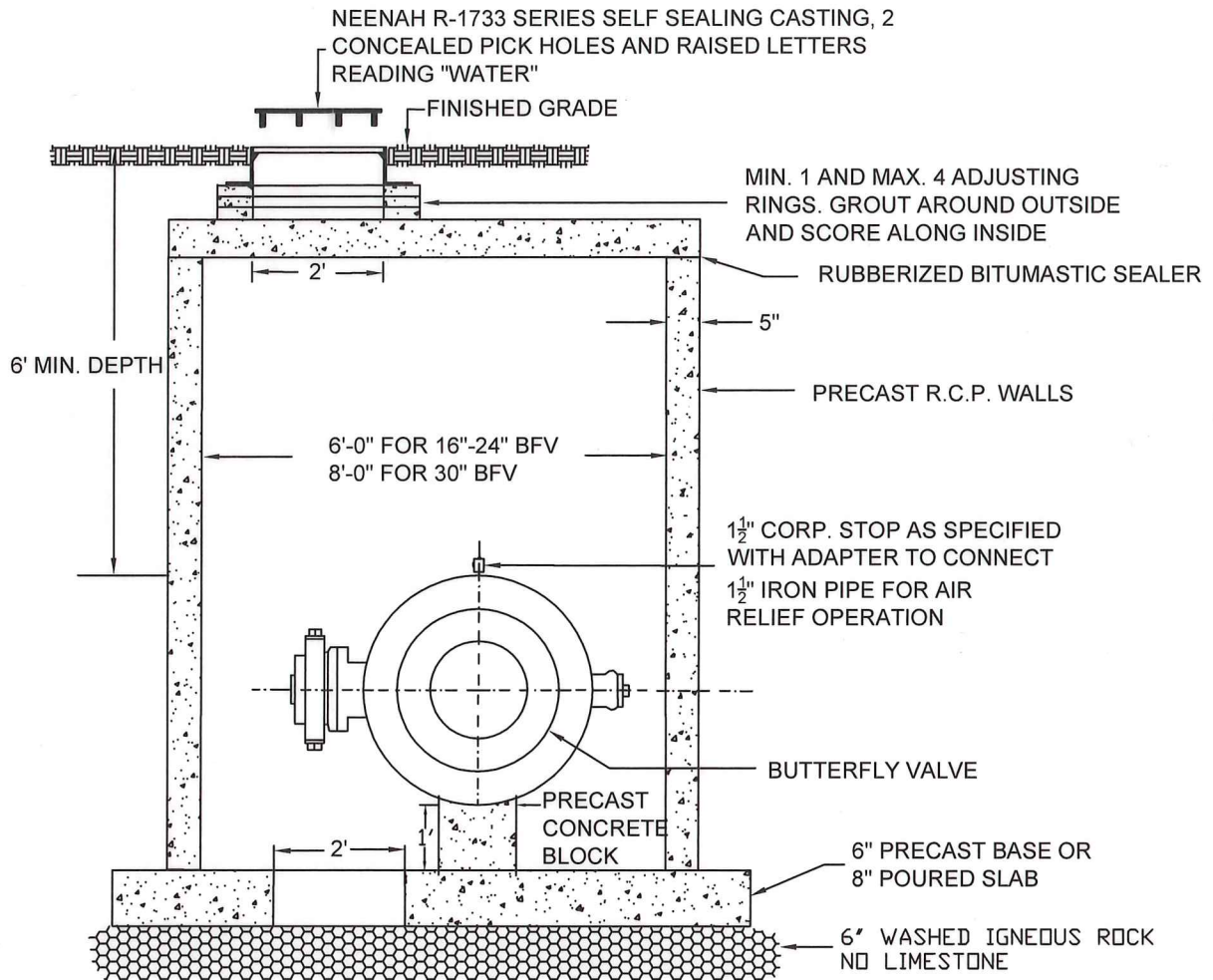
5/24/12

20

CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION





- NOTES: 1. OPERATING NUT MUST BE CENTERED UNDER MANHOLE OPENING.  
 2. GEARBOX MUST POSITIONED SO IT IS REMOVABLE AND MAINTAINABLE.  
 3. MARKING POSTS SHALL BE SUPPLIED BY THE CITY AND INSTALLED BY THE CONTRACTOR AT ALL MANHOLES LOCATED OUTSIDE OF THE STREET RIGHT-OF-WAYS.  
 4. NO MANHOLE STEPS ALLOWED.

STANDARD  
DETAIL NO.  
WTR-07

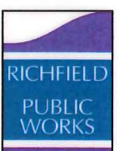
## BUTTERFLY VALVE MANHOLE

APPROVAL

5/24/12

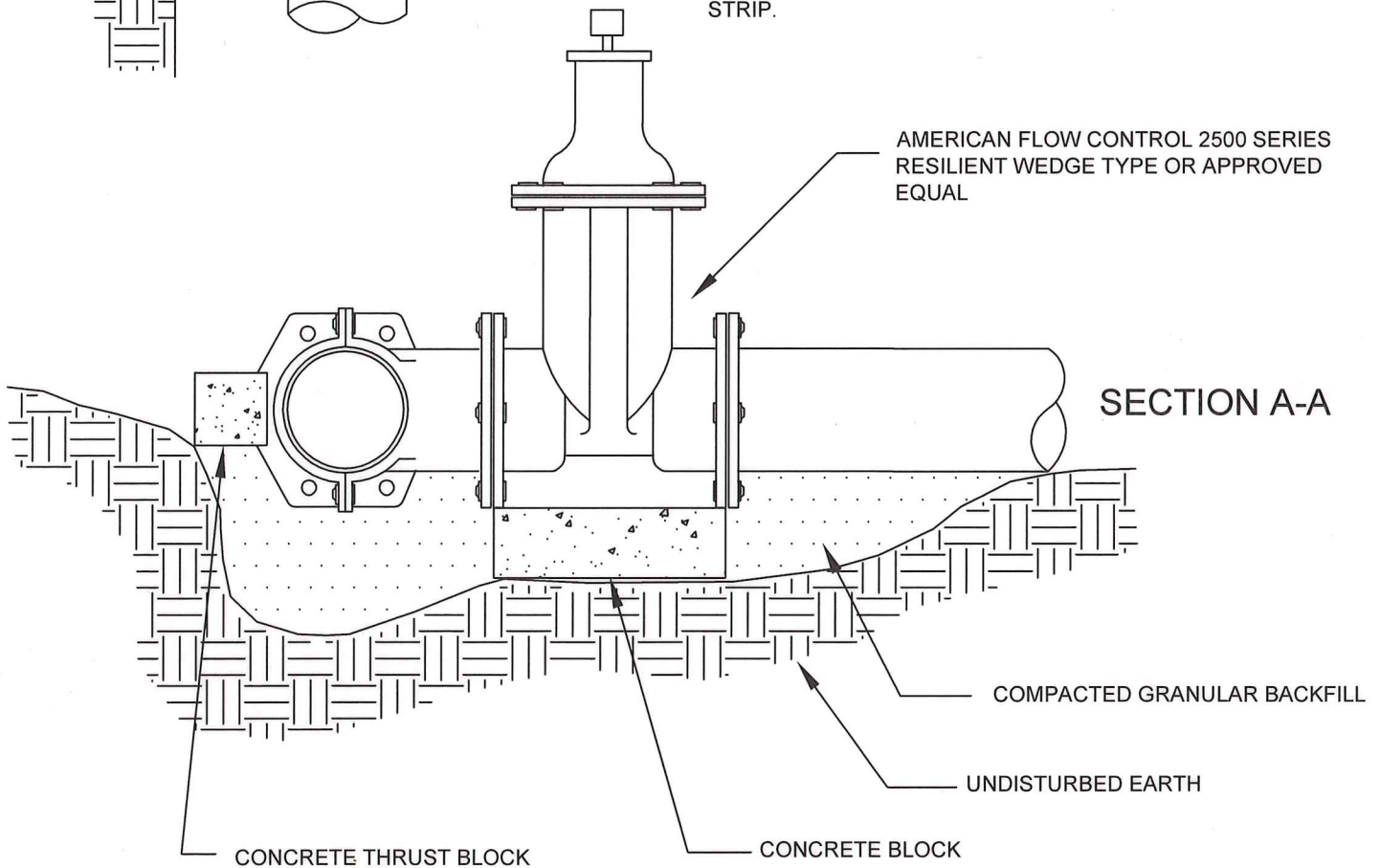
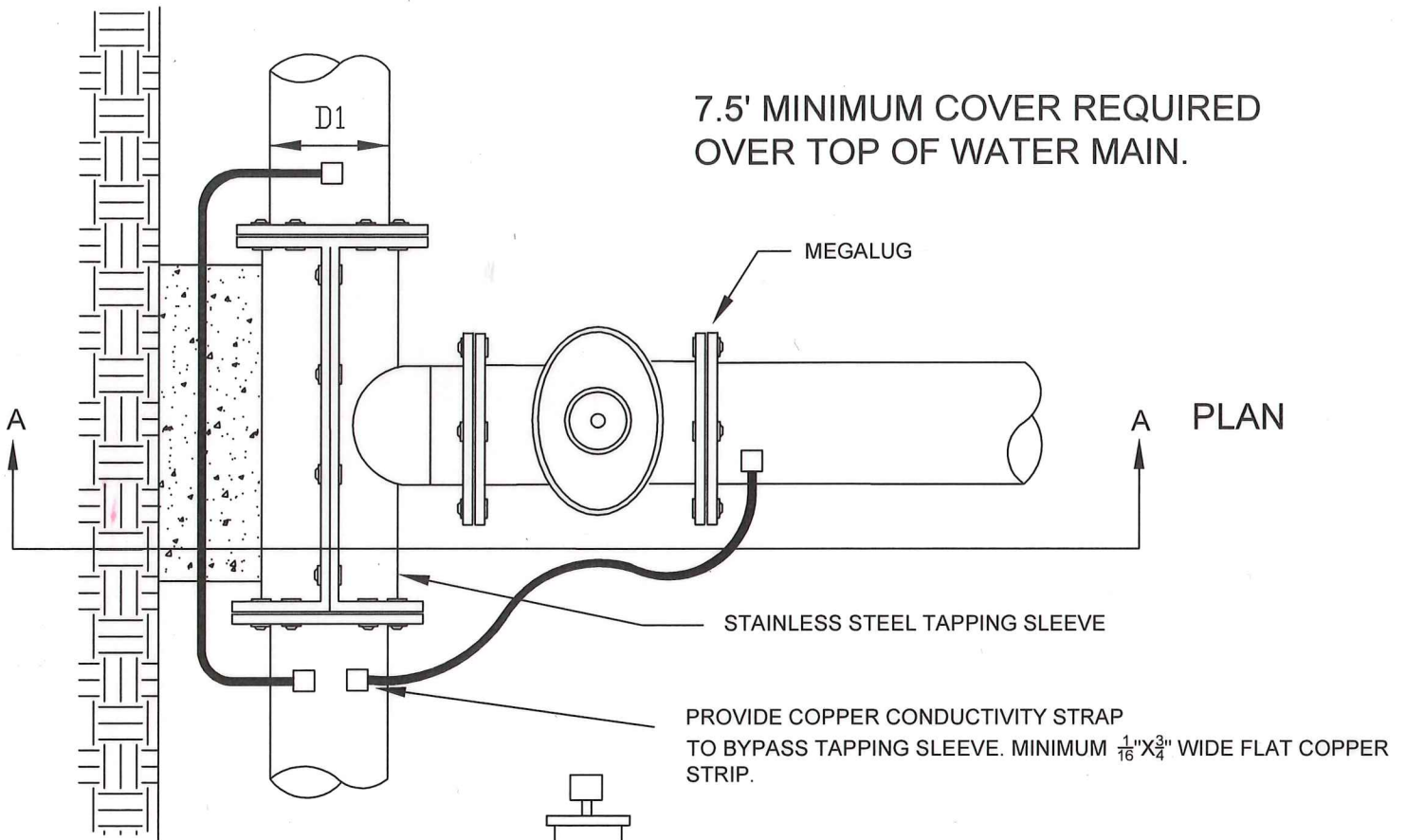
*[Signature]*  
CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION





7.5' MINIMUM COVER REQUIRED  
OVER TOP OF WATER MAIN.



STANDARD  
DETAIL NO.  
WTR-08

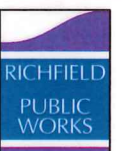
## WATER MAIN WET TAP

APPROVAL

5/24/12  
20

CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION





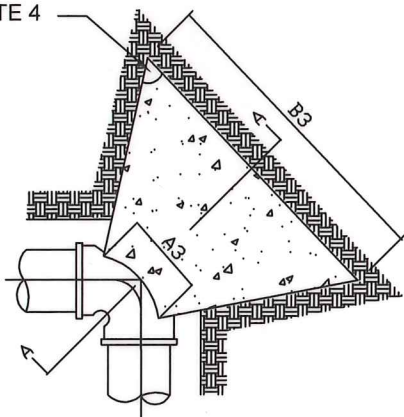
**NOTES:**

1. SHAPE OF BACK OF BUTTRESS MAY VARY AS LONG AS POURED AGAINST FIRM UNDISTURBED EARTH.
2. DIMENSION C1, C2, C3 SHOULD BE LARGE ENOUGH TO MAKE ANGLE  $\theta$  EQUAL TO OR LARGER THAN  $45^\circ$ .
3. DIMENSION A1, A2, A3 SHOULD BE AS LARGE AS POSSIBLE WITHOUT INTERFERING WITH MJ BOLTS.
4.  $\theta = 45^\circ$  MINIMUM.
5. PLACE POLYETHYLENE BETWEEN CONCRETE AND PIPE.

**BUTTRESS DIMENSIONS**

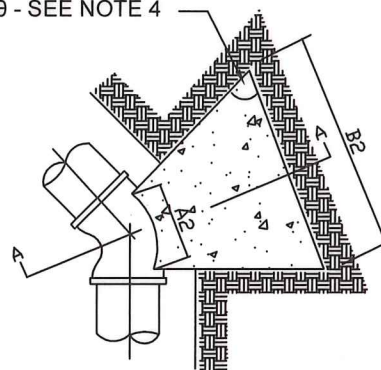
PIPE SIZE	22 $\frac{1}{2}^\circ$ BEND		45° BEND		90° BEND	
	B <sub>1</sub>	D <sub>1</sub>	B <sub>2</sub>	D <sub>2</sub>	B <sub>3</sub>	D <sub>3</sub>
6"	1'-5"	1'-5"	1'-5"	1'-5"	2'-1"	1'-5"
8"	1'-5"	1'-5"	2'-1"	1'-6"	2'-8"	2'-0"
12"	1'-10"	1'-10"	3'-4"	2'-0"	4'-9"	2'-6"
16"	3'-0"	2'-0"	3'-10"	3'-0"	6'-2"	3'-6"
20"	3'-6"	2'-8"	5'-6"	3'-4"	8'-4"	4'-0"
24"	4'-4"	3'-0"	6'-10"	3'-10"	9'-8"	5'-0"
30"	----	----	9'-3"	6'-0"	17'-0"	6'-0"

$\theta$  - SEE NOTE 4



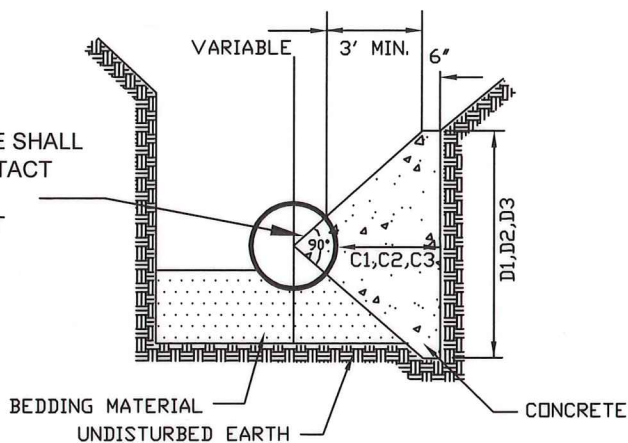
**PLAN 90° BENDS**

$\theta$  - SEE NOTE 4



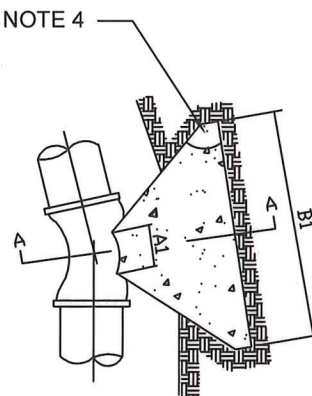
**PLAN 45° BENDS**

CONCRETE SHALL BE IN CONTACT WITH THIS QUADRANT OF PIPE.



**SECTION A-A**

$\theta$  - SEE NOTE 4



**PLAN 22 $\frac{1}{2}^\circ$  BENDS**

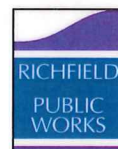
STANDARD  
DETAIL NO.  
WTR-09

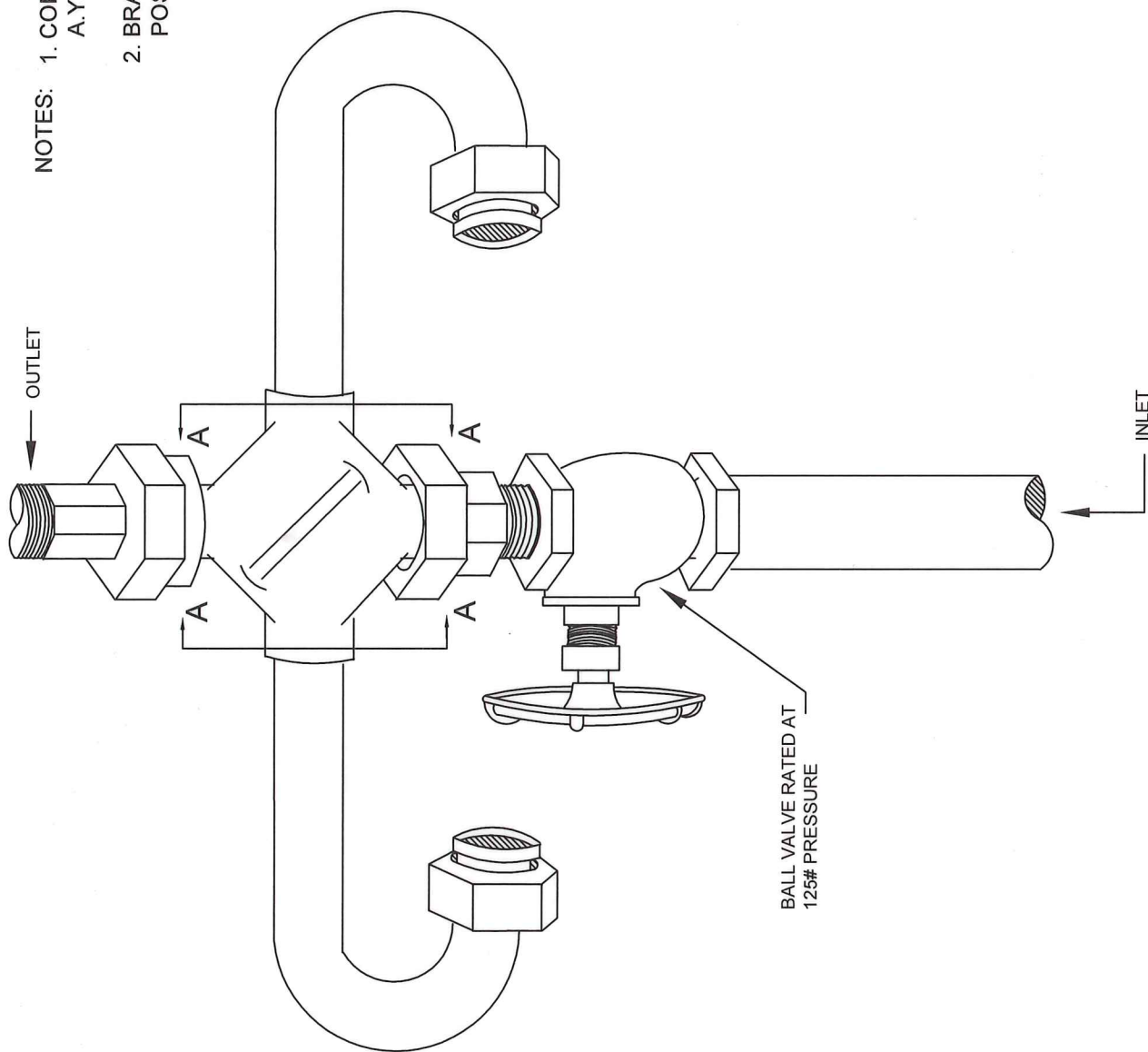
**CONCRETE  
THRUST BLOCK**

APPROVAL

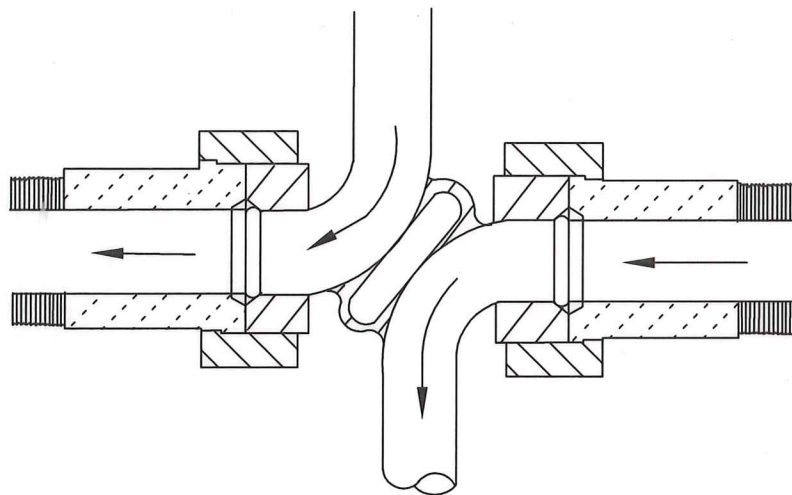
5/24/12  
CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION





- NOTES: 1. COPPER METAL BRACKET SHALL BE  
A.Y. MCDONALD 40 SERIES OR AN APPROVED EQUAL.
2. BRACKET TO SUPPORT WATER METER IN PROPER  
POSITION.



DETAIL A-A

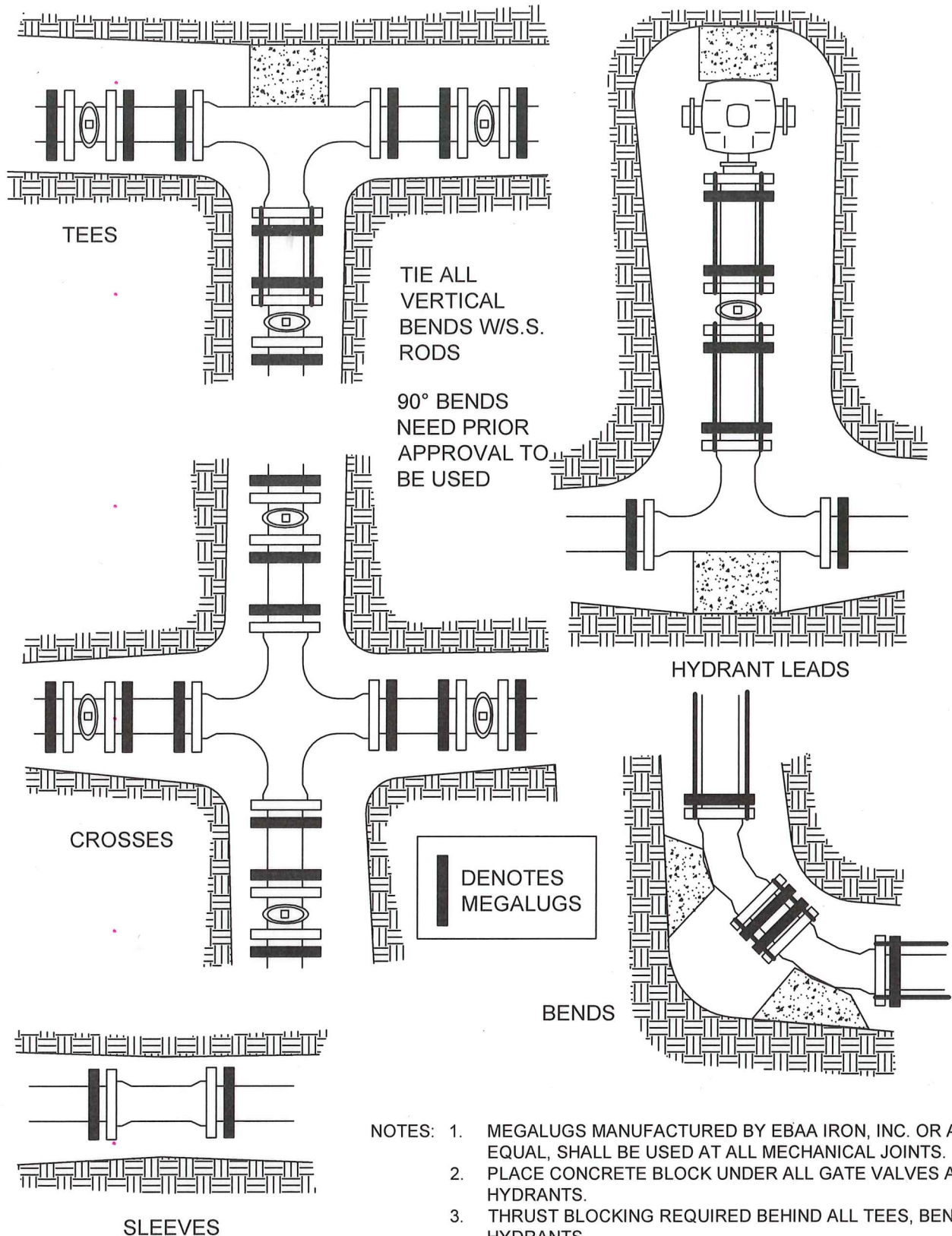
STANDARD  
DETAIL NO.  
WTR-10

# WATER METER HORN

APPROVAL 5/24/12 20  
CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION





- NOTES:
1. MEGALUGS MANUFACTURED BY EBAA IRON, INC. OR APPROVED EQUAL, SHALL BE USED AT ALL MECHANICAL JOINTS.
  2. PLACE CONCRETE BLOCK UNDER ALL GATE VALVES AND HYDRANTS.
  3. THRUST BLOCKING REQUIRED BEHIND ALL TEES, BENDS AND HYDRANTS.
  4. ALL BOLTS, T-BOLTS, NUTS AND RODDING INSTALLED BELOW GRADE SHALL BE ASTM F593 TYPE 316 STAINLESS STEEL.
  5. ALL NUTS AND BOLTS ON MJ FITTINGS SHALL BE CORE-BLUE APPROVED EQUAL.

STANDARD  
DETAIL NO.  
WTR-11

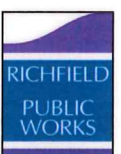
## TYPICAL MEGALUG/ ROD LOCATIONS

APPROVAL

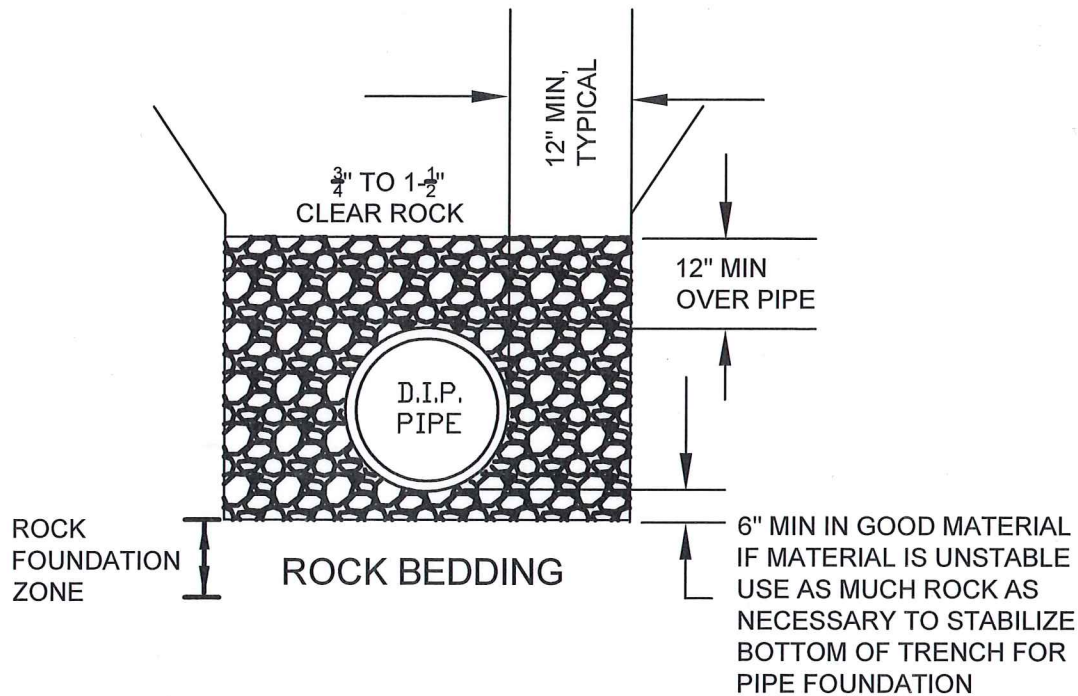
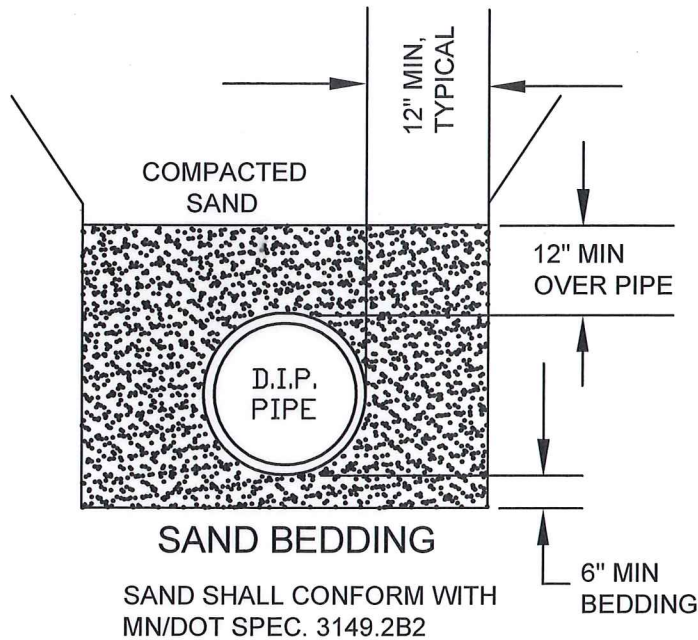
3/27/2013

*[Signature]*  
CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION







NOTE: 1. BEDDING SHALL BE CONSIDERED INCIDENTAL TO THE PIPE UNLESS MODIFIED IN THE CONTRACT DOCUMENTS. BEDDING REQUIRED FOR ALL MAINS AND SERVICES.

STANDARD  
DETAIL NO.  
WTR-12

## WATERMAIN BEDDING

APPROVAL

12/16/2014

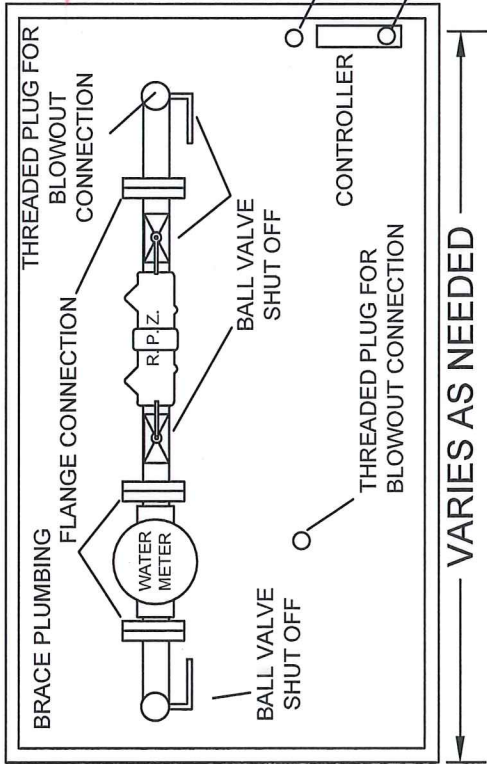
*[Signature]*  
CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION



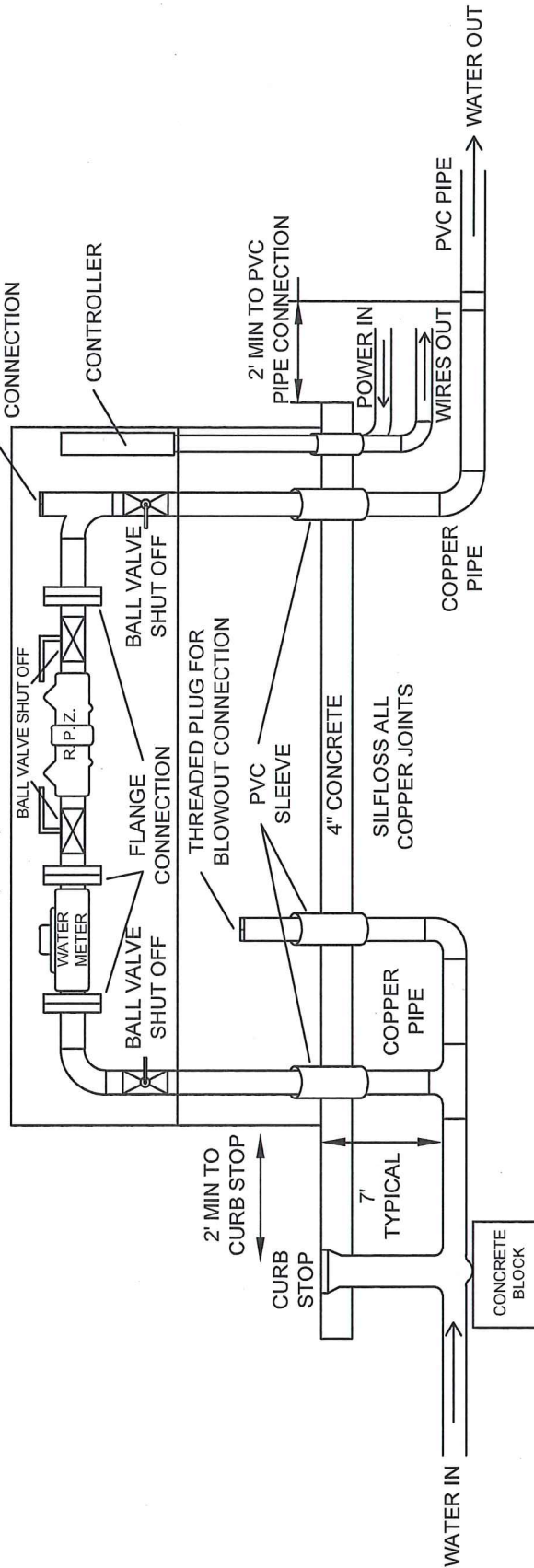
DRAWING NOT TO SCALE

SET BACK 2/3  
OF THE WAY TO  
BACK OF CABINET



THIS IS A SCHEMATIC DRAWING FOR REFERENCE ONLY, THIS IS NOT A COMPLETE DESIGN. EACH SYSTEM TO BE CUSTOM DESIGNED FOR EACH APPLICATION AND APPROVED BY THE CITY OF RICHFIELD.

POWER AND WATER TO BE SUPPLIED TO CABINET. SEE WTR-13 FOR ADDITIONAL IRRIGATION CABINET, CONTROLLER, VALVES, PIPE, AND WIRING DETAILS.



STANDARD  
DETAIL NO.  
WTR-13A

# IRRIGATION SYSTEM (COPPER)

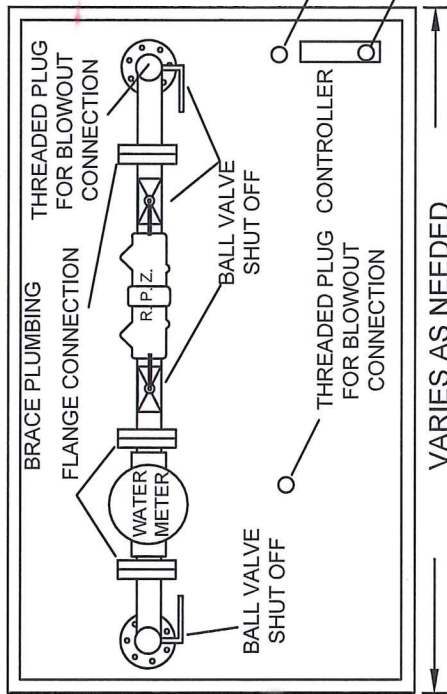
APPROVAL *[Signature]* 20 *[Signature]*  
CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION



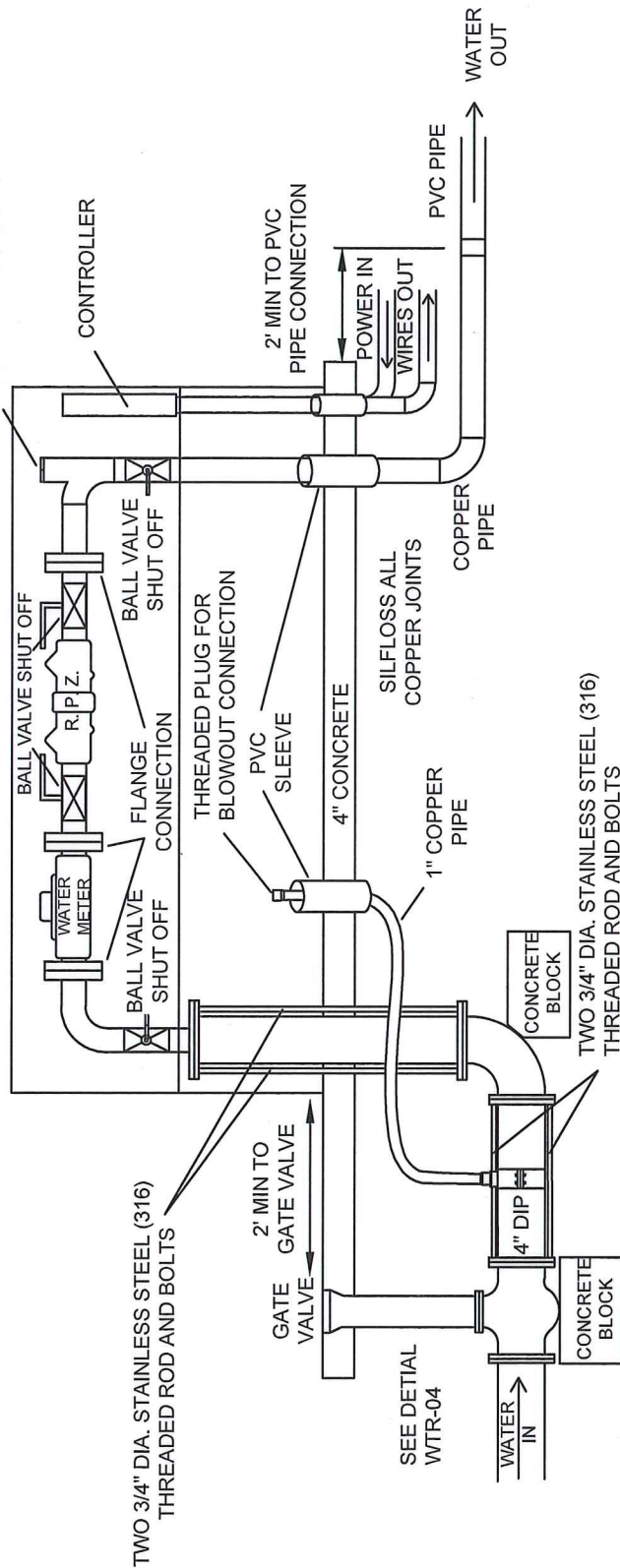
DRAWING NOT TO SCALE

SET BACK 2/3  
OF THE WAY TO  
BACK OF CABINET



THIS IS A SCHEMATIC DRAWING FOR REFERENCE ONLY THIS IS NOT A COMPLETE DESIGN. EACH SYSTEM TO BE CUSTOM DESIGNED FOR EACH APPLICATION AND APPROVED BY THE CITY OF RICHFIELD. POWER AND WATER TO BE SUPPLIED TO CABINET.

SEE WTR-13 FOR ADDITIONAL IRRIGATION CABINET, CONTROLLER, THREADED PLUG FOR VALVES, PIPE, AND WIRING DETAILS.



# IRRIGATION SYSTEM (DIP)

STANDARD  
DETAIL NO.  
WTR-13B

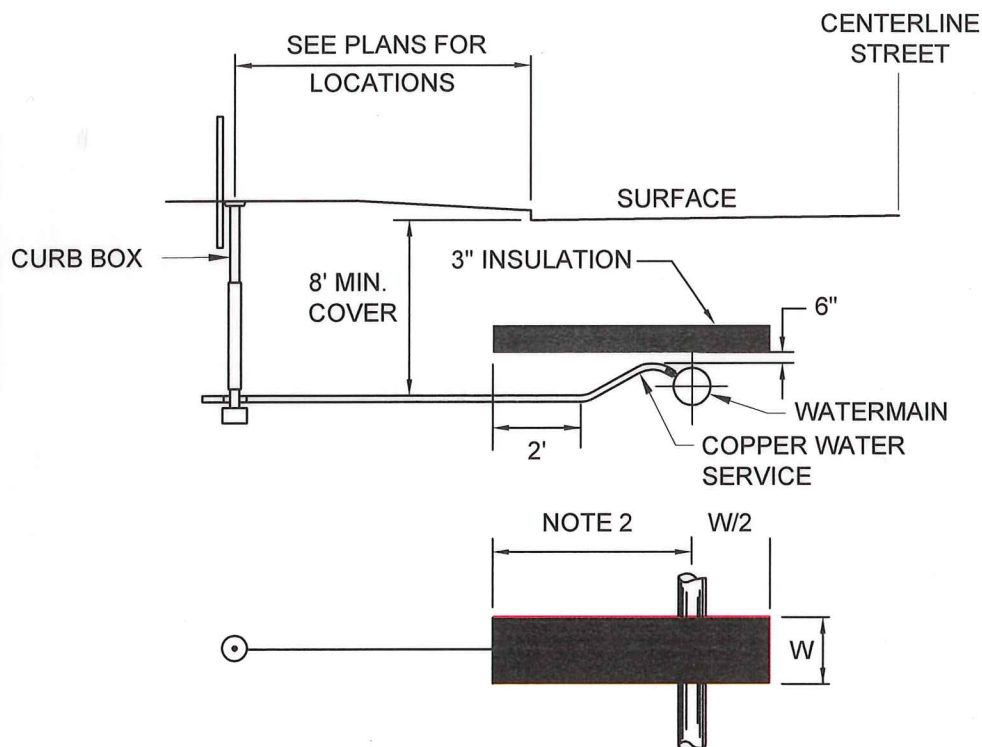
APPROVAL 2/16/2014  
CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION





TABLE 1	
COVER D	WIDTH W
4.0'-4.9'	8'
5.0'-5.9'	6'
6.0'-7.0'	4'
7.0'+	0'



- NOTE S:
1. WATERMAIN AND SERVICE LINES SHALL BE INSTALLED WITH 8' OF COVER. WHERE THE PLANS REQUIRE OR THE ENGINEER ORDERS AN INTALLATION WITH LESS THAN 8' OF COVER, TABLE 1 SHALL BE USED TO DETERMINE THE WIDTH OF INSULATION REQUIRED.
  2. INSULATION SHALL BE CARRIED OUT 2' BEYOND THE POINT WHERE 8' OF COVER HAS BEEN RE-ESTABLISHED.
  3. INSULATING MATERIAL SHALL BE PLACED ON A SMOOTH, LEVEL FOUNDATION WHICH HAS BEEN FIRMLY COMPACTED WITH A HAND-OPERATED, VIBRATORY COMPACTOR. SEPARATE LAYERS USED TO MAKE UP THE 3" THICKNESS SHALL HAVE STAGGERED JOINTS TO ENSURE CONTINUITY. AFTER PLACING THE INSULATION, BACKFILL WITH 12" OF LOOSE MATERIAL AND COMPACT WITH A NON-VIBRATORY ROLLER THEN RETURN TO STANDARD BACKFILL PROCEDURES OUTLINED IN THE SPECIFICATIONS. USE EXTREME CAUTION WHEN WORKING NEAR THE CORPORATION STOP TO ENSURE THE CONNECTION TO THE MAIN IS NOT DAMAGED.
  4. INSULATION SHALL BE EXTRUDED POLYSTYRENE (XEPS) INSULATION BOARD, "CERTIFOAM SE", OR "STYROFOAM SM" OR EQUIVALENT, EXCEPT AS FOLLOWS; WHERE MN/DOT "STANDARD FOR SPECIFICATIONS FOR CONSTRUCTION" APPLY INSULATION BOARD SHALL BE "CERTIFOAM 40", OR "STYROFOAM HI-35 OR HI-40", OR EQUIVALENT.
  5. BASIS FOR PAYMENT: WHERE THERE IS NO BID ITEM TO FURNISH AND INSTALL INSULATION, PAYMENT WILL BE MADE FOR MATERIAL COST ONLY BASED ON APPROVED INVOICES. INSTALLATION SHALL BE INCIDENTAL.

STANDARD  
DETAIL NO.  
WTR-14

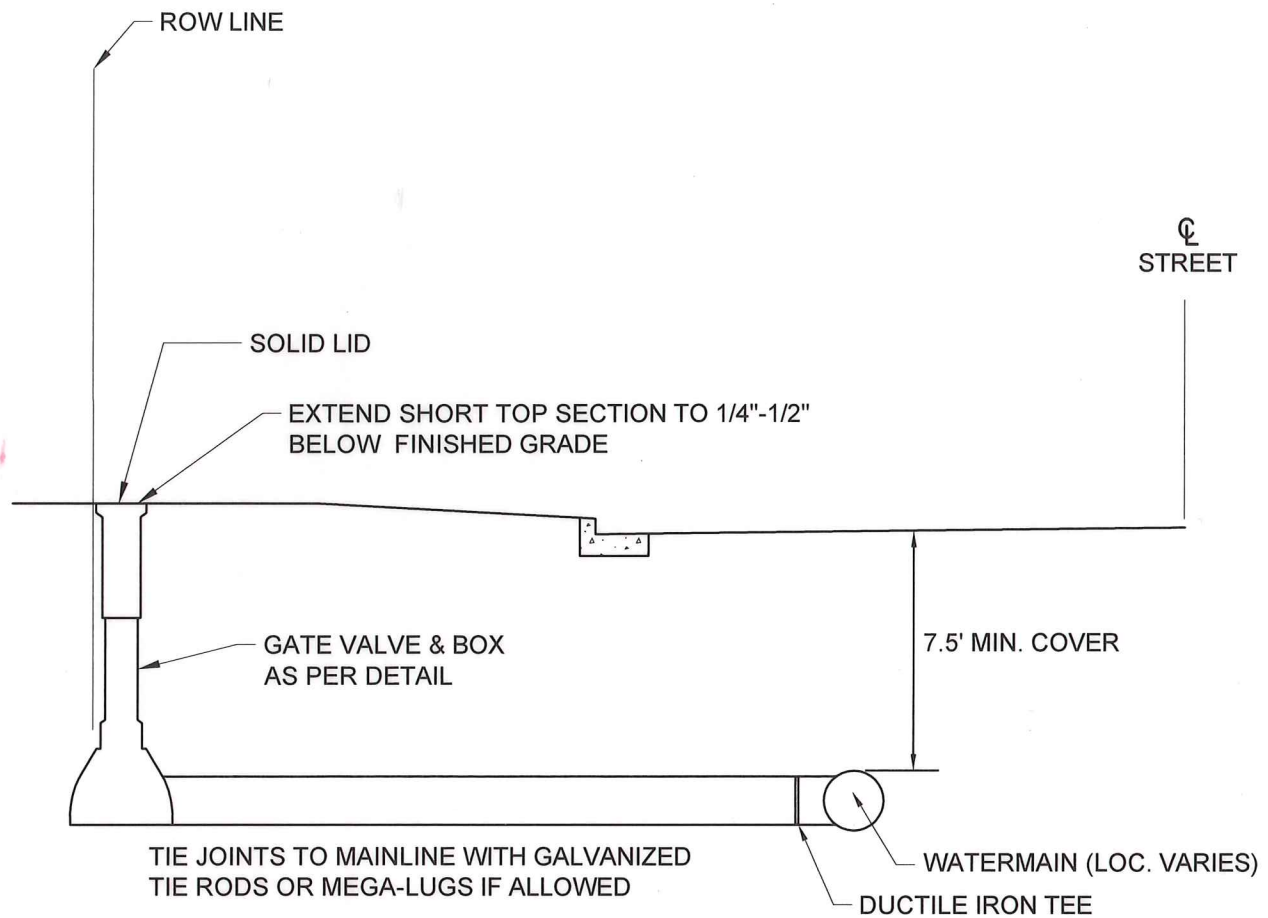
## WATER SERVICE INSTALLATION

APPROVAL

*[Signature]* 20 12  
CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION





- NOTES:
1. SEE SPECS FOR SIZE & TYPE OF MATERIALS.
  2. MAINTAIN 18" VERTICAL & 24" HORIZONTAL SEPERATION BETWEEN SEWER AND WATER SERVICES LINES.
  3. WATER SERVICES SHALL NOT BE MORE THAN 10' DEEP. PROVIDE EXTENSION PIECES AS REQUIRED. PAYMENT FOR EXTENSION PEICES SHALL BE FOR MATERIALS ONLY, BASED ON APPROVED CHOICES.
  4. PROVIDE GATE VALVE BOX WITH LID MARKED "WATER".
  5. WHERE WATER MAIN IS HDPE; USE HDPE MJ ADAPTORS TO CONNECT TO THE DUCTILE IRON PIPE.

STANDARD  
DETAIL NO.  
WTR-15

## COMMERCIAL WATER SERVICE CONNECTION

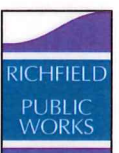
APPROVAL

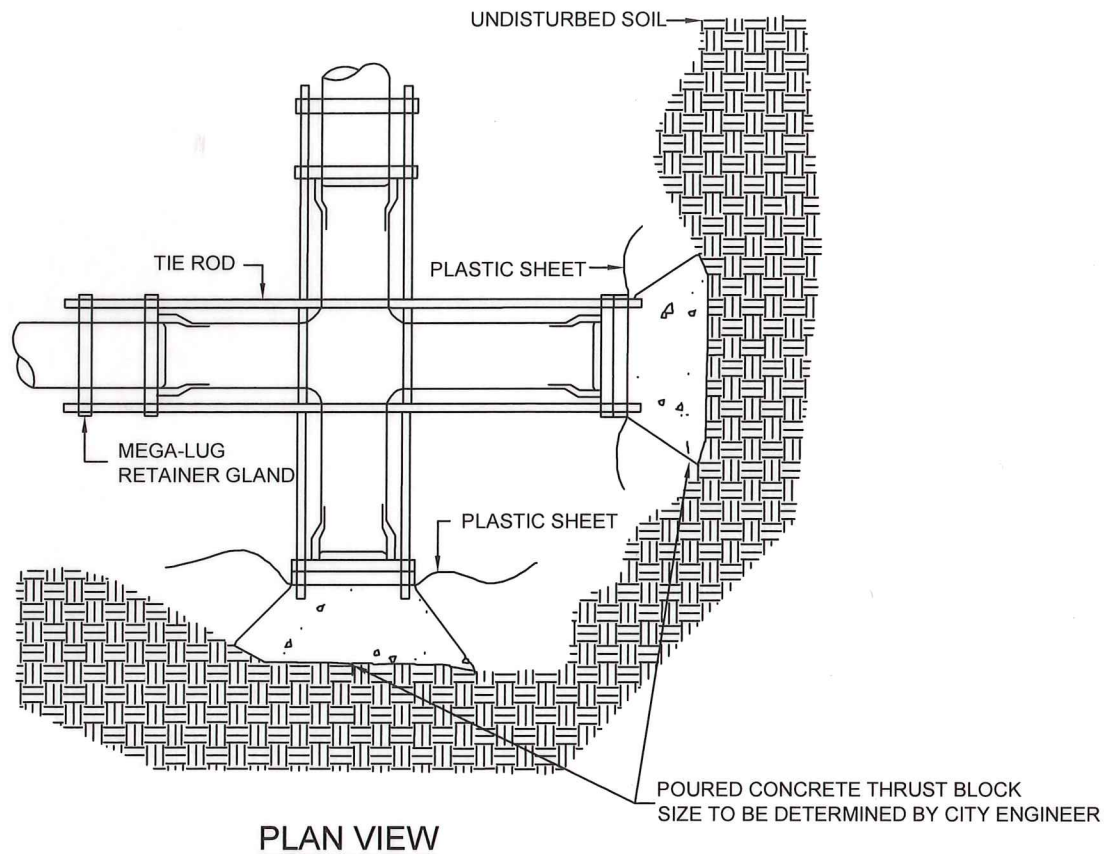
5/24/12

20

*[Signature]*  
CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION





- NOTES: 1. TYING BACK PLUG (TIE RODS) SHALL BE DONE IN ADDITION TO THRUST BLOCKING.  
 2. TIE RODS TO BE  $\frac{3}{4}$ " DIAMETER THREADED (316) STAINLESS STEEL.  
 3. TYING BACK PLUG IS INCIDENTAL TO WATERMAIN INSTALLATION.  
 4. ALL WATERMAIN BOLTS ARE CORE-BLUE OR APPROVED EQUAL.  
 5. POURED CONCRETE OR PRECAST BLOCKS TO BE USED FOR BLOCKING (NO WOOD, CURBING, SIDEWALK, ETC.).  
 6. PRECAST BLOCKS (MANHOLE BLOCKS OR EQUAL) MAY BE USED ON 6" OR 8" WATERMAIN.  
 7. PLASTIC SHEETING SHALL BE WRAPPED AROUND PLUG PRIOR TO POURING CONCRETE.  
 8. CONCRETE SHALL NOT BE POURED AROUND SIDES OF PLUG.  
 9. CONCRETE SHALL BE 4000 PSI.  
 10. ALL SERVICE STUBS AND FUTURE WATERMAIN EXTENSIONS MUST HAVE A 1" CORP AND 1" TYPE "K" BLEED OFF AS DIRECTED BY THE CITY ENGINEER.

STANDARD  
DETAIL NO.  
WTR-16

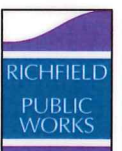
## TYPICAL WATERMAIN PLUG

APPROVAL

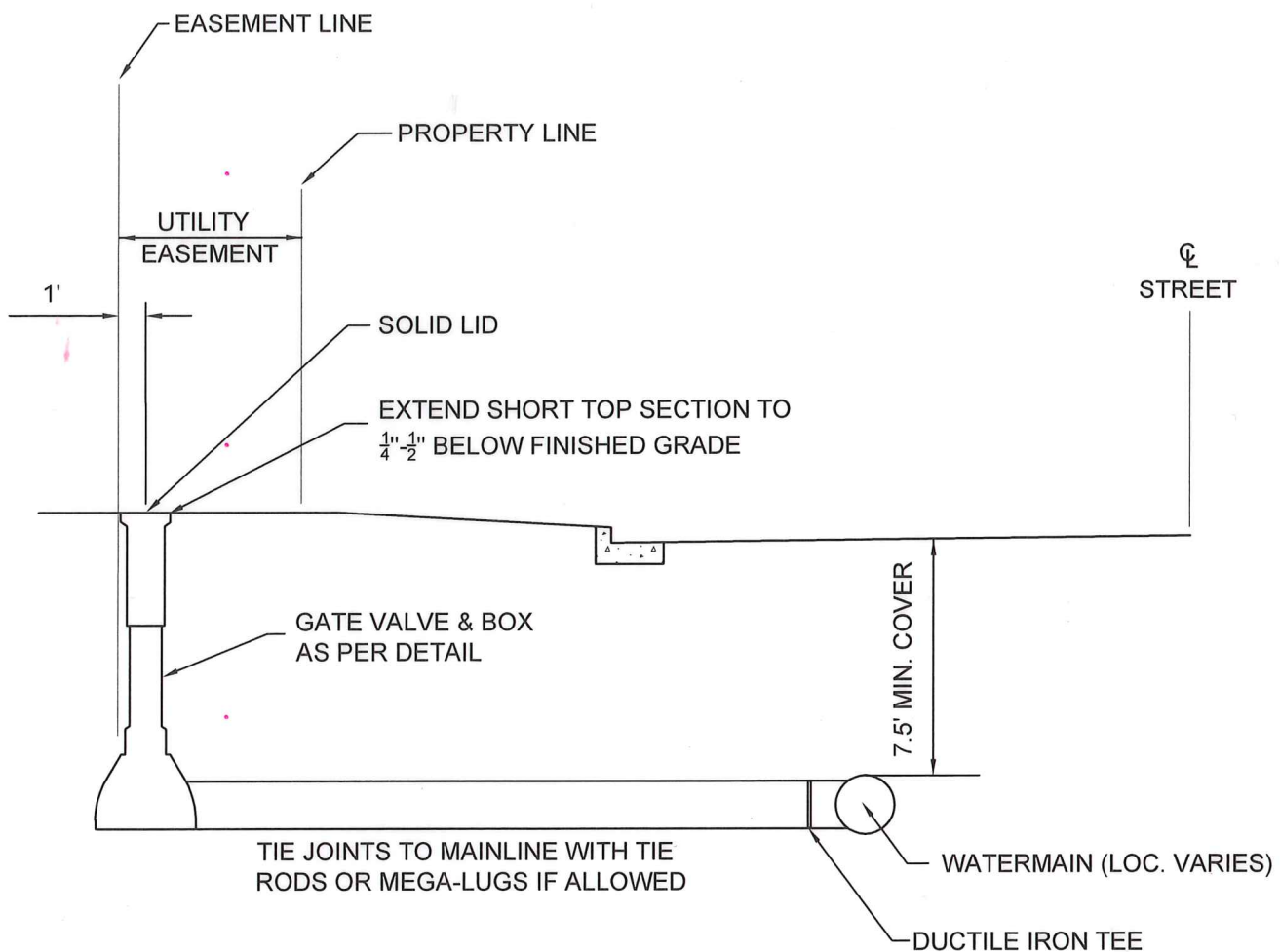
5/24 2012

CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION







- NOTES: 1. SEE SPECS FOR SIZE & TYPE OF MATERIALS.  
 2. MAINTAIN 18" VERTICAL AND 24" HORIZONTAL SEPARATION BETWEEN SEWER AND WATER SERVICE LINES.  
 3. WATER SERVICES SHALL BE MORE THAN 10' DEEP. PROVIDE EXTENSION PIECES AS REQUIRED. PAYMENT FOR EXTENSION PIECES SHALL BE MATERIALS ONLY, BASED ON APPROVED INVOICES.  
 4. PROVIDE GATE VALVE BOX WITH LID MARKED "WATER".  
 5. TIE RODS TO BE  $\frac{3}{4}$ " DIAMETER THREADED (316) STAINLESS STEEL.

STANDARD  
DETAIL NO.  
WTR-18

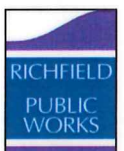
**COMMERCIAL/  
INDUSTRIAL  
WATER SERVICE  
CONNECTION**

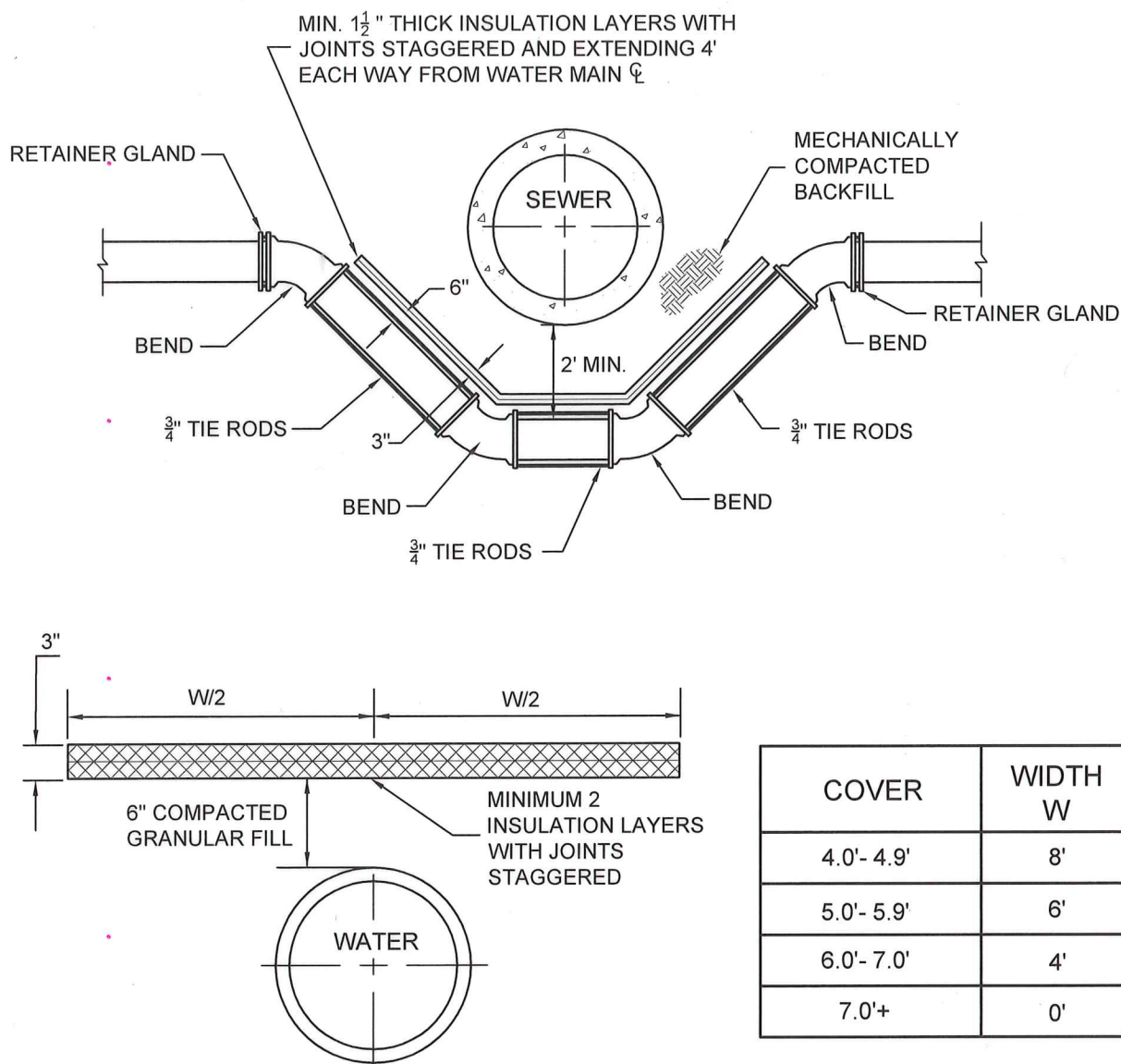
APPROVAL

2/27/2013

*[Signature]*  
CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION





- NOTES:
1. INSULATION SHALL BE EXTRUDED POLYSYRENE (XEPS) INSULATION BOARD, "CERTIFOAM SE" OR "STYROFOAM SM" OR EQUIVALENT, EXCEPT AS FOLLOWS: WHERE MN/DOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION" APPLY, INSULATION BOARD SHALL BE "CERITFOAM 40" OR "STYROFOAM HI-35 OR HI-40" OR EQUIVALENT.
  2. INSULATION SHALL BE PLACED ON A SMOOTH, LEVEL FOUNDATION WHICH HAS BEEN FIRMLY COMPACTED.
  3. SEPARATE LAYERS OF INSULATION USED TO MAKE UP THE 3" THICKNESS SHALL HAVE STAGGERED JOINTS TO ENSURE THE CONTINUITY OF THE INSULATION.
  4. LENGTH AND WIDTH OF INSULATION SHOWN ON PLANS IS APPROXIMATE. SEE TABLE 1 FOR ACTUAL WIDTH REQUIRED ONCE THE ACTUAL DEPTH OF WATER MAIN IS KNOWN.

STANDARD  
DETAIL NO.  
WTR-19

## WATER MAIN INSULATION

APPROVAL

2/27/2013

*[Signature]*  
CITY ENGINEER

CITY OF RICHFIELD  
ENGINEERING DIVISION

